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EXPLANATION OF PLATE XXI.

Botrychium biternatum (Lam.) Underw., natural size, with segment enlarged. Drawn by Miss Julia E. Clearwaters, from herbarium specimen collected at Auburn, Ala.

A NEW SMUT.

I WISH to call the attention of mycologists to one of the Ustilagineæ which presents some features of interest. It is of the *Doassansia* group and occurs in the culms of *Glyceria fluitans*, the white mycelium ramifying through the tissues and in the central cavity. The wall of the young sorus is formed of coherent brown hyphæ arching from base to apex. Outside of the wall are a few white unmodified hyphæ extending from the base to or toward the apex. When the young sorus is crushed in water under a cover glass the contents are seen to consist of a transparent substance which protrudes from the rent in the wall of the sorus like the ascus of a *Sphærotheca*, and which is immediately withdrawn into the sorus when the pressure is removed. When the sorus is mature the spores are irregularly one to three deep on the surface, lying upon dark brown pseudoparenchyma which constitutes the greater part of the sorus, but which is limited internally by a narrow layer of hyphæ lining a central cavity into which the free ends of the hyphæ project a few micra. It may be that the parenchymatous tissue in time fills the sorus, as I have not sectioned sori that had germinated.

The sori are most readily found in the central cavity of the host, loosely attached to its walls, and are most common in the lower internodes. It was collected at Racine, Wisconsin, and Mr. H. F. Lueders kindly searched for and found it at Sauk City, Wisconsin.

I found it difficult to induce the spores to germinate. Material, however, that had been collected the previous year and kept continuously exposed to the weather was found to be germinating in the latter part of September. Sori from this material placed in distilled water on a slide in a moist chamber showed slender promycelia projecting from the sori, each of which bore at its apex a globule of fluid within which the sporidia were formed, the globules increasing in size as the sporidia developed. When two globules came in contact they coalesced, and thus the sporidia of two or more promycelia would lie in a single globule. These globules resemble oil droplets in appearance. One

germinating sorus from which the culture drop had receded put forth long hyaline somewhat sinuous filaments, the branches (lateral) of which resembled promycelia and bore globules at their tips. The after development of the sporidia I have not seen. The structure of the mature sorus of this fungus seems to approximate it to the genus *Burrillia*, established by Dr. Setchell for a species growing in the leaves of *Sagittaria*.⁵ It may be characterized as follows:

Burrillia globulifera, n. sp. Sori globose to elliptical, dark brown or black, surface uneven, 250–450 μ in diameter. Spores one to three deep on the surface of the sorus, dark brown, closely compacted, irregularly polyhedral, 6–9 μ in diameter. Sorus beneath the spores composed of dark brown pseudoparenchyma limited within by a narrow layer of hyphæ enclosing a central cavity. Development of the sorus centripetal. Germination of the spores in the sorus. Promycelia about 2 μ in diameter, 30–80 μ long, brownish, studded with numerous minute rounded prominences. Sporidia 4 to 8 or more, terminal, whorled, cylindrical, 12–18 \times 3 μ , formed in a globule of fluid.

In the culms of *Glyceria fluitans* R. Br. Racine and Sauk City (*Lueders*), Wisconsin. October and later. To be distributed in Ellis and Everhart's *North American Fungi*, no. 3481.—J. J. DAVIS, *Racine, Wisconsin*.

⁵ Annals of Bot. 6: 36–37. 1892.